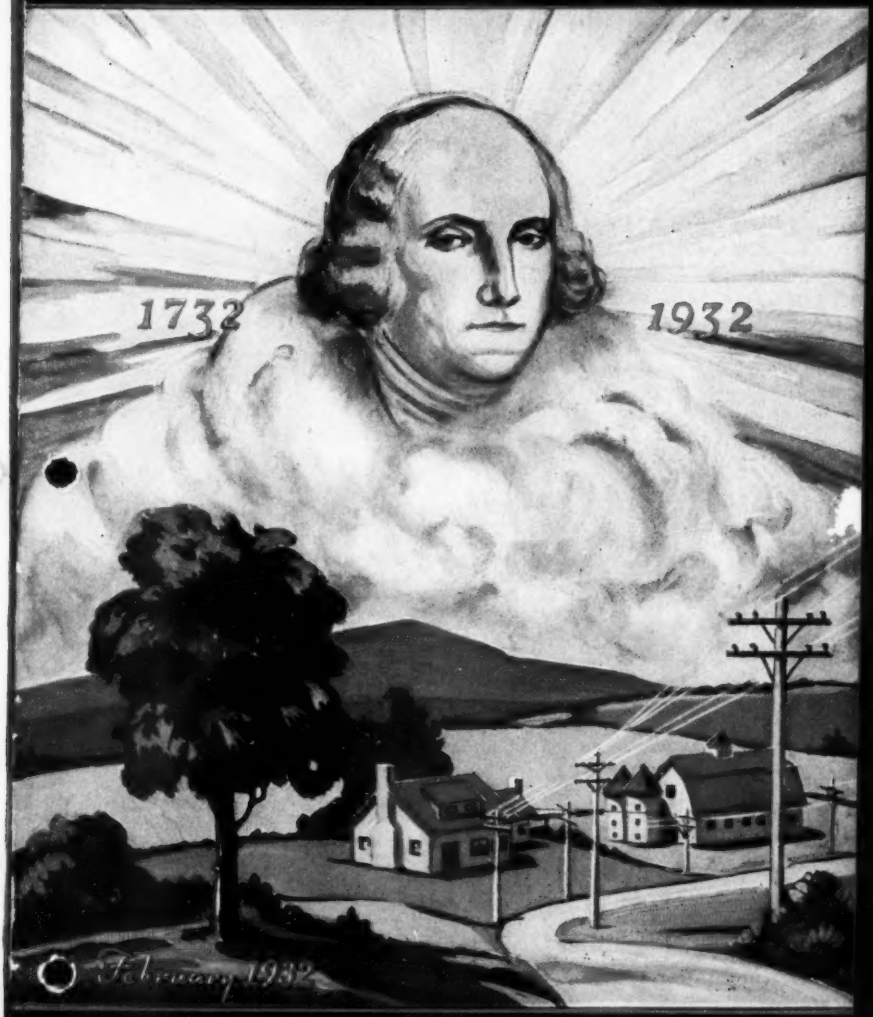
Electricity on the Farm

A Monthly Magazine for the Progressive Rural Family



February 1932

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Switch to electric cookery *now!*

It's cool, clean, economical —and so amazingly simple!

NOW the average cost of cooking electrically is as little as one cent per meal per person. And so slight is your food shrinkage that the same quantities you have been using now go a full 20% further.

But these are by no means the only economies. Your food is always perfectly prepared. Your pots and pans, no longer sooty, need no laborious scouring. Your kitchen walls and woodwork, too—how bright they remain when flameless, sun-pure electricity is doing your cooking for you!

Electric cookery releases hours of your time daily for other things. Send for complete information — or ask your power company.

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Hotpoint

Automatic Electric Ranges

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
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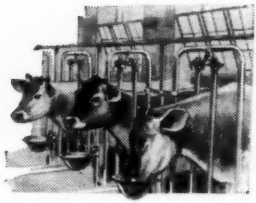
Economical. So convenient. And heated with the famous Million Dollar General Electric Hotpoint Hi-Speed Heating Unit, the Calrod! . . . Prices surprisingly moderate. Write for literature — or ask your power company.

SWIFT AS ELECTRICITY . . . CLEAN AS ELECTRIC LIGHT

The Water System

that YOUR Farm *needs*



The depth of your well, the amount of its flow, the height and distance to which water must be delivered, the quantities required for different purposes, the power that will be used—these and many other factors govern the style and type of water system that will function most satisfactorily on your farm.

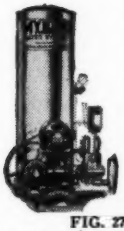


FIG. 2510
An electric powered system for shallow wells. Complete automatic control. No personal attention needed.

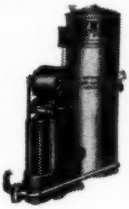


FIG. 2700
An automatic water system for deep wells. Powered with electric motor. Self-starting and self-stopping.

FIG. 2549
For shallow wells — power pump with easy starting gasoline engine. Can be arranged to stop automatically.

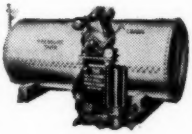


FIG. 2551
Deep well power pump, with easy starting gasoline engine, as it is usually attached to pressure tank.

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Self-Oiling
Water Systems

No matter what your requirements, the Myers Dealer can furnish a water system that will exactly fit them. He has no need to recommend any make-shifts. The Myers line of Water Systems is ***the most complete*** offered by any manufacturer. It includes types and sizes to fit all conditions. There is a time-tested, trouble-proof Myers unit ready to serve you with absolute reliability and the greatest possible economy.

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Pumps for Every Purpose, Water Systems, Hay Tools, Door Hangers

Electricity on the Farm

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Vol. 5 No. 2

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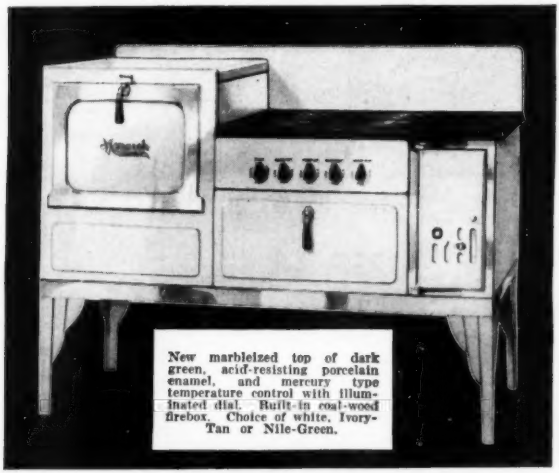
BEHOLD

the new Monarch

Conso-Fuelectric H17F . .


New marbleized top of dark green, acid-resisting porcelain enamel, and mercury type temperature control with illuminated dial. Built-in coal-wood firebox. Choice of white, Ivory-Tan or Nile-Green.

To the many users of Monarch Electric Ranges:

This new Monarch was not designed to make you envious.

Rather, because Monarch must continue to develop new ideas in range design to maintain its position as the leader in the field.

Remember, your present Monarch is just as attractive as the day you bought it. It will give you many more years of reliable, economical service. And by the time you are ready for a new one, there will doubtless be other new designs, still undreamed of, for you to choose from.

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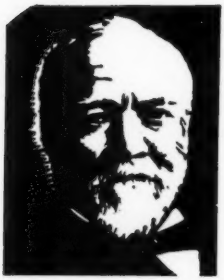
Monarch

MALLEABLE IRON RANGE CO., 400 Lake St., Beaver Dam, Wis.

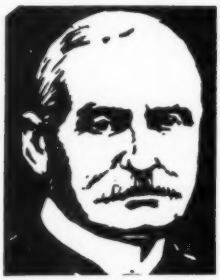
THEIR Confidence was Justified



WHEN PIG IRON DROPPED 50% IN 1907, ANDREW CARNEGIE DECLARED:

"This panic will soon run its course and pass away leaving no impediment to the return, in due season, of another period of wholesome, because needed, expansion of our resources. . .

We have had the greatest expansion of modern times. Reaction had to come—will prove healthful. Nothing can stay the rapid progress of the Republic. She is all right."



WHEN DEEP, DARK GLOOM RULED IN 1921, THOMAS FORTUNE RYAN SAID:

"Our merchants have been buying only what they can sell quickly for cash. The consumer has had to listen to so much pessimistic talk that he buys only what is absolutely necessary. People everywhere have been scared. They are getting over that.

"Our people are the greatest consumers of food and manufactured articles in the world in normal times—and normal times are coming back. . . ."

AMERICA CAME THROUGH!

In 1893 stark ruin stalked through the land. 467 banks failed in a few months. Mills, furnaces and factories shut down everywhere. Bankruptcy was on every hand. America had twice as many unemployed per thousand population as she has today. But she put them all back to work.

In 1907 panic broke loose. The production of pig iron dropped 50% in less than a year. All but the strongest men lost heart—"We are ruined," they declared, "recovery cannot come in our time." Yet in two years prosperity had returned.

In 1921, when many honest and thoughtful people were predicting worse conditions, the country was already beginning to climb to the greatest era of prosperity it had ever experienced.

History tells how America has fought and won 19 major depressions. Good times always follow hard times, as surely as day follows night. Prosperity always comes back. It is coming back *this* time, too.

Above all things, let us have faith.

America Has Beaten 19 Major Depressions

She will Beat this one

THE NATIONAL PUBLISHERS ASSOCIATION

"As the most nearly self-contained nation, we have within our own boundaries the elemental factors for recovery."

(From the Recommendations of the Committee on Unemployment Plans and Suggestions of the President's Organization on Unemployment Relief.)

"Cheap" Wiring Expensive

An old Japanese proverb says: "A cheap buyer gets bad meat." Similarly, the man who buys a low price job of electric wiring is likely to get trouble and dissatisfaction.

The electrical contractor who does the cheapest work is ordinarily the one who knows the least about it; in fact, he is not apt to know what the work is actually going to cost him in labor and materials. He usually looks at the other fellow's figures, and then quotes lower, without making calculations.

When it comes to doing the job, and he finds he is going "in the hole," he then begins skimping, with the result that when the work is finally completed no one is satisfied. The contractor has made no money, and the customer has an inferior job. Unfortunately, it is only after the customer has used the system for some time that he begins to discover its limitations and defects. By that time the installation bills have been paid, and any corrections in the wiring will cost more money.

An adequate and safe wiring installation may cost a little more than a mediocre, incomplete job, but the additional cost is the best investment a farmer can make, when he is having his place wired for electric light and power.

Good wiring means safe wiring; and the experienced contractor will recommend to his customer what he considers best in the way of outlets, equipment, etc. Careful installation means the minimum of trouble, and, consequently, of inconvenience. Adequate size of wire eliminates unnecessary drop in voltages, and insures proper operation of apparatus.

The price-cutting contractor may recommend smaller sized wire to handle a given load than will the reputable contractor, and while the wire may be sufficiently large to safely carry the load, the unnecessary loss in voltage due to the smaller wire will cost the customer, in the long run, many times more than the saving in price of installation.

A good rule to follow in electric work is to go to a dependable, well-established contractor, seek his advice, and take it. It will ultimately save trouble, money, and inconvenience.

Mr. C. Albert Fox, owner of Brandywine Jersey Farms, West Chester, Pa., and the milk cooling equipment that he describes as one of his best investments

MILK COOLING MAKES MONEY FOR THIS DAIRYMAN

By STANLEY TOBIN

THE margin between a profit and a loss in the operation of Brandywine Dairy Farms, near West Chester, Pa., this year depended on the electrical refrigeration of milk. The savings and bonuses which this form of milk cooling brought to this farm provided a satisfactory margin of profit for 1931, according to C. Albert Fox, owner. "My total savings with electric refrigeration amount to about $250 a month," said Mr. Fox. Without this margin, I could not profitably operate my dairy farm today."

We believe that his opinions, based upon ten years experience with electric refrigeration and a number of years with other forms of milk cooling, are of interest to dairy operators everywhere. Ten years ago he purchased the first equipment sold by Frigidaire Corporation for the cooling of milk, he says. Previous to that time he had been using manufactured and natural ice.

"When I used ice to cool milk," Mr. Fox said, "I required about 300 pounds a day. At 60 cents a hundred pounds, this cost $1.80 a day, or $54 a month. My average monthly electric bill today is about $20. This includes lights for five buildings and the operation of a water pump, an electric hay hoist, a household electric refrigerator and a number of motors around the farm. I do not believe that the compressor used on my milk cooler consumes half of this electricity.

Some Cost Figures

"If I figure $8 a month for operating my milk cooler, I am saving $46 a month out of the old cost of refrigeration. Although this is a considerable saving, it is not, by far, the greatest benefit from my milk cooling equipment. Today I am able to deliver grade 'AA' milk the year round. This pays me a bonus of three cents a quart. This bonus on 6,000 quarts, the average amount I ship monthly, amounts to $180 a month.

"There is still an additonal saving. When I used ice it was

This milk house adjoins the dairy barn at Brandywine, and like everything on the farm is modern and well kept

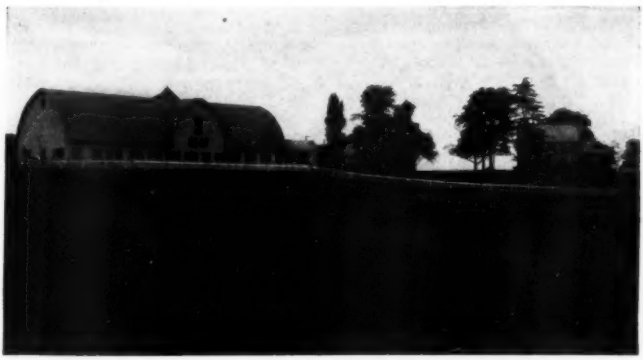
necessary to haul it from West Chester, which is four miles away. This work of hauling and handling the ice took two hours of one man's time. Figured at 40 cents an hour, this amounted to 80 cents a day, or $24 a month.

"My electric refrigeration equipment cost me in the neighborhood of $500 and long ago has paid for itself. In fact, the investment was retired just a few months after the equipment was installed.

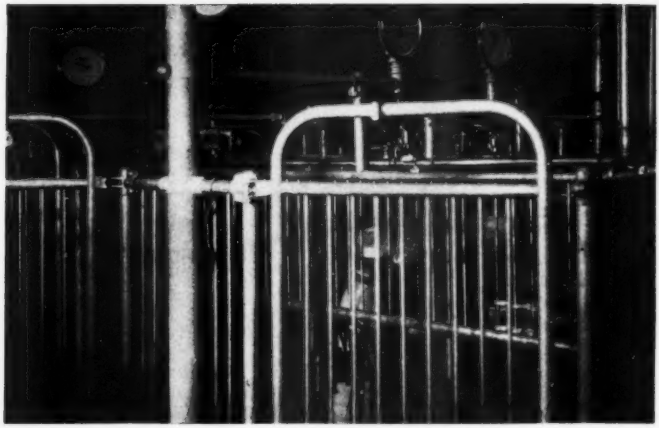
"I have not lost a single can of milk since my equipment was installed. This is another saving, as rejections run high for some dairy farmers who do not have modern equipment. This item has not been included in my total savings figure, as there is no way in which I can estimate it."

A tank type cooler, two by eight feet and twenty inches deep, is used on the Brandywine farm. It will hold eight 40 quart cans. The temperature of the plain water in the tank is pulled down around 34 and 35 degrees before milking time and very rapid cooling is accomplished when the cans are placed in the tank.

Mr. Fox insists that were he deprived of his electric refrigeration he would quit the milk business tomorrow.



Brandywine Jersey Farms where some of the highest quality milk produced in Pennsylvania originates



The Milking Stalls

Piping the Milk

FROM BARN TO BOTTLE

By E. R. MEACHAM

IT was four o'clock, milking time at Charmany Farms. For some time the men had been working about the immaculate milking room where the cows are brought to the machine, instead of the machine to the cows, and from which the milk goes to the bottling plant in a pipe instead of a bucket.

Mr. W. A. Simpkins, manager of the farm, was talking to us in his office. Mr. Simpkins has had a life time of experience in the production of high quality milk. He has recently taken charge of this fine farm near Madison and has installed the new combined milking system developed by R. R. Graves of the United States Bureau of Dairy Industry.

"I have read a good deal about this system," I said, "but I've never seen it in operation before."

"It is in use in several places in the East, but not often in dairies of this size," Mr. Simpkins replied, "and this is the first one in Wisconsin. We are installing it on Charmany Farms because we believe this system makes it easier to produce clean milk with a low bacteria count, and that's what we're after, for we aim to supply the finest milk used in our capital city."

At that moment Gust Dauman, the herdsman, came to the door. "We're ready to start," he said.

We followed him into the barn. Instead of taking a pail or starting a milking machine, he opened a door at the end of the litter alley, and unlocked the stanchions of the first four Guernseys. They seemed to know what was expected of them, for they backed out of their stalls and with a little urging, walked out through the open door and up a cleated runway into the wash room.

"That's my part of the milking,"

said Dauman. "When those are washed, I'll let out four more, and as they come back after they're milked, I stanchion them up again."

So we left the barn and went up into the wash room. It was small and warm, well lighted by windows on both sides and by four electric lamps in big white globes. There were stalls for four cows, but no stanchions. At the front end of each stall there are two little iron gates which when closed keep the cow from going through. These gates can be opened by a lever extending to the rear.

As each cow entered her stall, the wash room man, W. Morley, hooked a chain behind her. Then with a brush attached to a hose he carefully washed her udder, flanks and tail with warm water.

"They like it," he told us, with a friendly smile. "You can see how still they stand."

When he had finished the fourth cow, he took off the brush, and turned the hose on their feet, so they would not track manure into the milking room.

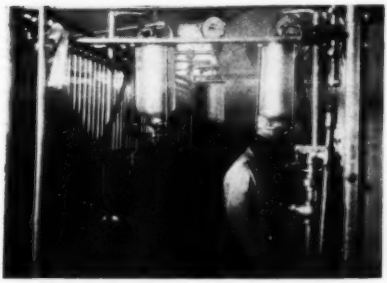
Next he picked up a rubber sponge and rubbed them down to take off as much water as possible. After that he took a little cup covered with black gauze and milked a stream or two from each teat into it.

"We milk out a few streams that we do not save," he explained, "because the milk that has collected in the cow's teats contains more bacteria than that which is secreted during the milking process. We milk it through this layer of black gauze so that we will be sure to see any ropiness that may indicate garget. If any of this milk leaves white specks on the gauze, that cow goes right back to the barn instead of the milking room."

When the first cow was ready, Morley pushed the handle that opened the little gates, and she walked out through the front of her stall, and through an open door into the milking room. There she found another gate swung across the passage. This guided her into a little box stall, hardly more than a cage. There was not room enough in it to turn around or even to go forward or back.

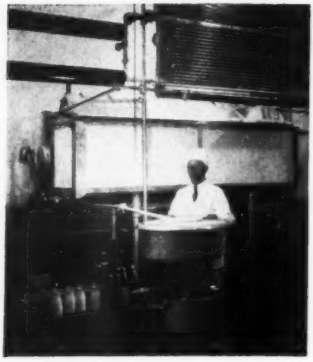
There were four of these little milking pens, but they were not arranged side by side like ordinary stalls in a barn. There were two, one ahead of the other, tandem fashion on each side of a pit where the milker

Washing the cows before milking



The milker stands in a pit with cows on both sides

The latch string is always out



Cooler, pasteurizer and bottler all depend on electric power

works. It was perhaps five feet wide by fourteen feet long, and deep enough so the milker can put on and take off the teat cups without bending over. In other words, the cows' udders are at the most convenient working height for him. On the side next to the pit the pen walls do not go clear to the floor. Up to about the height of a cow's flank there is a space with no bars, giving the milker a good chance to work.

Milking Operation

When the cow entered the milking stall, Hubert Jacobson, the white clad milker stationed in the pit, threw a lever that closed the gate and shut her in. Then he wiped off her udder with a paper towel and put on the teat cups which hung ready on a hook beside the stall. The other three cows took their places. In a moment four cows were being milked. The milk from each was drawn into a five gallon pyrex jar. Each jar hung on a separate scale above the pit.

"We can weigh each cow's milk at it is drawn, without carrying it, and without handling it," said Mr. Jacobson. "There is a great advantage in having those jars glass. It is easy to see when the milk stops coming. By working and kneading the udders, we are able to get it all. This does away with hand stripping entirely."

As soon as he took the teat cup off, Jacobson wet each teat with a sterilizing solution. Then he turned a cock which let the vacuum used in milking draw the milk out of the glass par through sanitary, nickle plated piping over to the bottling room.

One pull of a lever opened the exit gate of the stall. The cow strolled out and through a narrow passage back to the barn. A jerk at the lever closed the exit gate; another opened the entrance for the next cow.

Except for this very unusual method of milking, the dairy operations at Charmany Farms are much the same in other modern dairies. Only a pipe instead of pails and cans brings the milk

The new milking plant is at the left

from the milker to the big corrugated cooler hung high up in the bottling room. The upper half is cooled with water, and the lower half with brine from the electric refrigeration plant. As the milk pours down over this big surface in a thin sheet, it comes in contact with the air for the first time, and loses its volatile odors and flavors. After cooling it may be pasteurized or it may go directly to the bottler.

Gilbert Lund was just ready to start bottling as we came to this room.

Filling the Bottles

Out of the cooling room he brought empty ice cold bottles in cases stacked upon a little truck with big casters. He threw the motor switch and began to set empty bottles on the bottler. As each bottle came under the supply tank, a plunger shoved it up against the filler nipple. By the time it went around, the bottle was full. The same machine put the caps on. Lund set the bottles of cold milk back into the cases and carried them into the big, well lighted refrigeration room to await delivery.

To provide what cream is needed, there was also in the bottling room a modern separator with electric motor entirely enclosed and driving the separator bowl without cog wheels or gears of any kind.

Beyond the bottling room was the wash room where the trucks returning from the milk route, unload the empty bottles to be washed and sterlized. The generous supply of steam and hot water needed throughout the dairy comes from a boiler in the basement below.

Charmany Dairy has installed this system so recently that Mr. Simpkins has no figures on the saving of time or labor it will make. But he knows that other men have found it profitable.

Advantages of Combine System

The combine system has been used by the Federal Experiment Station at Beltsville, Maryland, for more than a year. It has shown the following advantages.

(1) Since there is no hand-stripping, no moving of the machine, and no handling of the milk, labor is reduced from 25 to 50% as compared to other milking machine methods. At the Beltsville farm where there are six stalls, but only three cows milked at a time, one man milks twenty-nine cows three times a day, and twenty-five cows twice a day, in a total of five and one-half hours. This is almost exactly twenty-five cows an hour.

Cleaner Milk

(2) Milk produced under these conditions is cleaner than it would otherwise be because it cannot be contaminated by dust or dirt in the barn, or by the milker's hands.

(3) The majority of the bacteria it does contain comes from the cow's udder and it is believed that these types yield more readily to pasteurization than some other forms of bacteria.

Experience at Beltsville indicates that milk produced by this system may be stored for several weeks without spoiling.

> DO your work—not just your work and no more, but a little more for the lavishing's sake; that little more which is worth all the rest. And if you suffer as you must, and if you doubt as you must, do your work. Put your heart into it and the sky will clear. Then out of your very doubt and suffering will be born the supreme joy of life.
>
> —Dean Briggs.

Some Interesting Figures on

BROODING BABY CHICKS

By J. P. SCHAENZER and C. C. BELL

C. C. Bell, Rural Manager, Wisconsin Valley Electric Co., Mr. and Mrs. John Endres, W. J. Rogan, County Agricultural Agent, and the brooder houses in which the costs of coal and electric brooding were compared

POULTRYMEN have realized that the amount of work and time involved in the brooding of baby chicks with electricity was considerably less than when using coal, wood, or oil. But they have thought that the cost of electricity for brooding was much higher than the cost of other methods. In order to get specific information on this subject and the proper methods of brooding baby chicks, Mr. C. C. Bell, Rural Manager, Wisconsin Valley Electric Company, secured the co-operation of three Wisconsin poultrymen in carrying on poultry brooding investigations during the spring of 1931.

One of these co-operators was John Endres, of Edgar. He and Mr. Bell decided that they wanted information on the comparative cost of operating a coal and an electric brooder.

Two similar brooder houses were used. The house in which the electric brooder was placed was fourteen feet square, while the one housing the coal brooder was twelve feet square. As coal brooders naturally heat the entire house, it was felt that the smaller house would be better for it. The electric brooder has very little effect upon the brooder house temperature. Both houses were seven feet high in front and five feet in the rear with a shed roof. The floor was constructed of double boards with paper between them. The walls and roof were built of single boards covered with paper.

A fifty-six inch hexagonal hover or canopy electric brooder was installed in the larger house. It was heated by a 600-watt glowing heating element, entirely separate from the canopy. The construction was such that it produced considerable circulation of air underneath the hover. No auxiliary heat was used during the entire brooding period. The coal brooder which was installed in the smaller-sized house had a canopy sixty inches in diameter. The electrically heated brooder was equipped with a curtain but the coal brooder was not.

On March 12, 420 day-old Leghorn chicks were placed under

each brooder. Each lot was brooded until April 15, or a period of 34 days. Three hundred ninety-one chicks were raised underneath the electric brooder and 411 underneath the coal brooder. This is 93 and 98 per cent respectively of the number of chicks which were started.

The electric brooder used 230 kilowatt hours of energy or 58.8 kilowatt hours for each 100 chicks raised. Nine hundred forty-six pounds of coal were required by the coal brooder.

The cost of the hard coal at $18 per ton was $8.51.

The electrically brooded chicks feathered out much faster and were much smoother in appearance than the coal brooded chicks. Perhaps due to the colder brooder house, they were always busily engaged in feeding when they came out from underneath the brooder; while the coal brooded chicks—where a high temperature was maintained throughout the entire brooder house—seemed to be of a much more nervous nature and more easily disturbed.

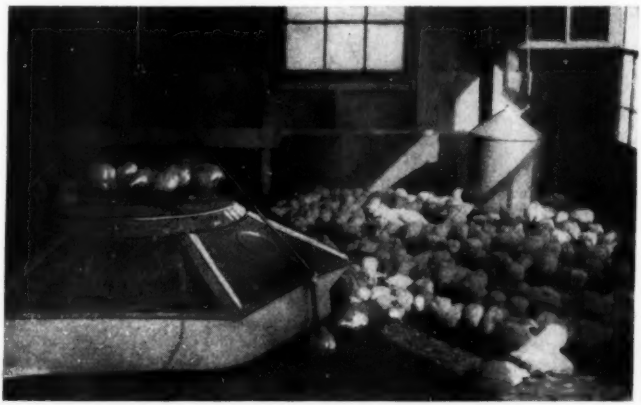
The inside temperature of the electrically heated brooder house dropped to as low as 29 degrees above zero when the outside temperature was 18 degrees. From this it may be seen that it is not necessary to maintain high temperatures in the brooder house for the successful brooding of baby chicks. But at such times the interior of the house was very damp. Ventilation seems necessary to remove the moisture.

Another very interesting record on the electric brooding of baby chicks was kept on the farm of Fred Rakow, Wausau, Wisconsin. A forty-two inch, round, canopy brooder with a 300-watt heating element was used. The latter was of the black heat type and has an outlet for a lamp which burns continuously. A 60-watt bulb was used. The presumption is that the light assists the chicks in finding their way back to the hover.

Construction Details

The brooder house was 12 feet long, 10 feet wide, 7 feet high in front and 5 feet in the rear, with a shed roof. Two thicknesses of matched lumber with paper between them were used in constructing the floor. Matched lumber and roofing paper were used for the walls and shiplap and roofing paper for the roof.

Two hundred fifty-five Single-Comb White Leghorns were secured from a local hatchery. These were placed underneath the brooder on April 1. The brooding was



The electrically brooded chicks feathered out much faster than coal brooded chicks and busily engaged in feeding when not under the brooder

continued until May 14, or a total of 44 days. Of the 255 chicks started, 238, or 93 per cent, were raised.

In Service Four Years

The lowest temperature inside of the house was 33 degrees when the outside temperature fell to 26 degrees. The electricity used for the entire period was 85 kilowatt hours, or 35.7 for each 100 chicks raised. This was the fourth season that this brooder was in use and it has given excellent satisfaction every year.

A commercial chick starter was used in feeding these chicks throughout the entire brooding period. Scratch feed was fed once a day after the chicks were five weeks old. The brooder house was moved to new ground before the chicks were let out for the first time on the thirtieth day of April. This was done to prevent the chicks from contracting any disease which may have been in the ground from previous years.

Fred Olsen, Edgar, Wisconsin, also co-operated in securing data on the electric brooding of baby chicks. His brooder house was very similar to those used by the other two co-operators, with the exception that the floor was built of a single thickness of matched lumber. It will be remembered that in the other two cases, a double thickness of boards with paper between was used. The size of the house was 18 feet long, 6 feet wide, 7 feet high in front, and 6.5 in the rear.

The brooder used in this trial was a 60-inch hexagonal canopy. It was larger than either one of the other two. The heating element was a 600-watt size and of the black heat type. It was supplemented with a 500-watt auxiliary heating unit. In this respect, it was different from the other two electric brooders. The extra heating unit was manually controlled but Mr. Olsen did not find it necessary to use it, as the chicks were brooded rather late in the season, from May 16 to June 13. The temperature in the house never fell below 50 degrees, and the outside temperature was never lower than 36 degrees. The auxiliary electric heating element may be of distinct value if the chicks are brooded during cold, early spring weather. It may also help materially in keeping the chicks and space underneath the brooder in a drier condition.

Mr. Olsen started with 303 Single-Comb White Leghorn chicks and of these raised 295, or 97 per cent. Two hundred four kilowatt hours of electricity were required to brood this lot. This is at the rate of 7.3 kilowatt hours per day, or 69.2 kilowatt hours per 100

About two-thirds of a kilowatt hour per chick was required for 295 chicks in this brooder house of Fred. Olsen, Edgar, Wisconsin

chicks raised. The increase in energy consumption over the other brooders may be partially due to the poorer floor construction which permitted the cold to enter below the brooder and the larger size of brooder which was used.

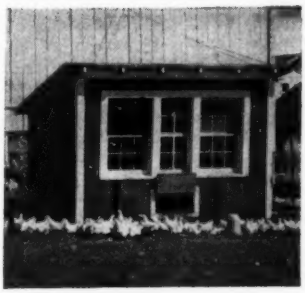
The same as for the other two lots, commercial chick feeds were used to feed these chicks. Toward the end of the trial, oatmeal and milk were included in the ration.

From these trials, it will be seen that there is a wide variation in the amount of electricity used per chick raised. Naturally this depends somewhat upon the per cent raised. The amount per chick will be very materially increased if rats, cats, or other animals kill a number of the birds, or, if they contract a contagious disease. In the trials conducted, the energy per chick was .59 kilowatt hours for Endres, .36 for Rakow, and .69 for Olsen. In other words Olsen used practically twice as much energy per chick as Rakow.

Minimum of Attention

These poultrymen have found that the electrically heated brooder requires very little attention. All that is necessary is to check the thermometer and adjust the regulator occasionally so that the thermostat works properly and a uniform temperature is maintained. There is no filling of lamps, adjusting of wicks, or cleaning of lamp chimneys. A great deal of labor and time is saved, as there are no fires to kindle, and to be kept up. Ashes do not have to be carried out with their accompanying dust. There are no gas fumes to asphyxiate the chicks and humans and very little danger of fire. It is not necessary to spend any time in purchasing fuel or hauling it home. The mortality and feed consumption are no higher for electricity than when other methods of heating the brooder are used.

It is very important that the correct size of brooder be used for the size of flock to be brooded. Most authorities agree that seven square inches of floor space underneath the brooder per chick is necessary. To determine the capacity



Fred. Rakow, Wausau, Wisconsin, raised 238 out of 255 chicks under an electric brooder in this brooder house

of the brooder in number of chicks, divide the number of square inches of floor space that it covers by seven, the number of square inches required per chick.

Experience has shown that the heating element should be of large enough wattage so as to provide a constant and uniform heat under all weather conditions. A size of two watts per chick is usually considered satisfactory, although in the colder climates, two and one-half or even three watts may be necessary. The total wattage of the brooders may range from 240 to 1000 or more, depending upon the size of the hover.

Additional Protection

As an additional precaution, a safety device known as a no-voltage or temperature alarm is oftentimes installed at a small additional cost to ring a bell when the current is off or the brooder is too hot or too cold. It enables the poultryman to cover the brooder with blankets or burlap sacks and so reduce the amount of ventilation and the radiation losses to a minimum. By this means, additional protection is provided and it may prevent serious losses. If the weather is not too severe, it is oftentimes possible to carry the chicks along for many hours without artificial heat or a serious loss.

One of the most serious and difficult problems in connection with

electric brooding of baby chicks is the ventilation of both the brooder and brooder house. This is necessary to keep the house and chicks dry, remove bad odors, and supply the necessary fresh air. By adjusting the height of the brooder, as the chicks grow larger and also increasing the distance between the curtain and the floor more ventilation will be provided. This may be accomplished by means of adjustable legs, or the brooder may be hung from the ceiling by means of a rope and pulleys and counterbalanced with a weight. The latter method is preferable as it provides for easy cleaning and adjustment. Some prefer to use both as a safety precaution.

Some poultrymen prefer to place the brooder and chicks on hardware cloth having a one-half inch mesh, which is placed several inches above the floor. This increases the ventilation and at the same time provides a place for the droppings and so improves the sanitary condition of the brooder.

These trials have shown that electricity for the brooding of baby chicks is economical, saves time, eliminates many hours of labor, raises a high percentage of the chicks and reduces the fire hazard to a minimum. The users are enthusiastic over the results and continue using electric brooders year after year.

Applying Electricity To Farm Tasks

ELECTRICITY played a large part in preserving the infant life of tens of thousands of the 6,000,000 baby chicks which were hatched in Western Washington last year; most of them in hatcheries where 50,000 or more are hatched each season.

Electric power was expected to take the place of gas and steam power and, due to its easy control, it was foreseen that great advantages would be derived in the way of convenience of operation. There was no doubt that electricity in the farm home would furnish light, would run such appliances as irons, washing and sewing machines, etc., and would, also furnish heat for cooking and water heating, in each case replacing other less satisfactory sources of energy.

In practice it has been found that the use of electricity has brought about changes in methods or conditions which have added a great deal to the comfort and profit of farming. In the reports of the national and state committees many examples can be found.

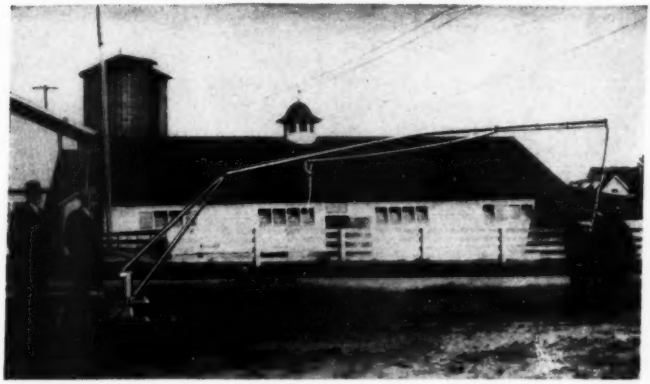
In one state the use of electric washing machines resulted in an increase of twenty per cent in the amount of clothes washed in spite of a decrease in the size of families of thirteen per cent. What a story of greater comfort and of freedom from the constant dread of "blue Monday" lies behind these figures.

Electric lights were found to increase the feeding capacity of one sheep barn twenty-five per cent. An addition of one-fourth to the working size of a large feeding unit as a by-product of the lighting system is certainly a welcome if unexpected piece of good fortune.

As a result of widespread tests on filling silos with small motors it has been demonstrated that satisfactory results may be obtained by slower filling and no tramping in the silo. This saving of one or two men's time is another by-product of rural electricity. In other instances automatic grain grinding equipment has been installed with a great saving in labor.

Perhaps the most promising of these unforeseen benefits from the use of electricity is the tendency towards greater effi-

(*Continued on page 20*)



J. J. Van Kleek, designer of the exerciser, and Prof. P. M. Brandt, head of the college dairy department, watch the machine give the dairy herd sire his daily workout.

A little motor keeps dairy herd sires ON THE MOVE

By C. D. BYRNE
Oregon State College

ELECTRIC power is being used successfully at Oregon State College in exercising animals, especially dairy herd sires. An electric bull exerciser, designed by J. J. Van Kleek, prominent dairyman of Beaverton, Oregon, has been under test for the past four months on the college farm and has proven both practical and economical.

The machine consists of a simple gear powered with a three-fourths horsepower motor. Attached to the gear is a 15-foot arm of hollow cast-iron pipe. A spring device on the arm provides the tying point for the lead rope of the animal, eliminating the rigidity of a solid fastening and giving some play for the animal in stopping, starting and turning around. The gear is equipped with a pair of trips which can be adjusted to make the arm operate in a complete circle or any part of a circle.

"The machine grew out of a need for some device that would exercise my valuable dairy herd sires so that they would not become unmanageable and would retain their potency as herd sires," says Mr. Van Kleek, the designer of the exerciser. "The old tread-power type of exerciser was unsatisfactory because the animal

was going up hill all the time, could not turn around, and was walking on a wooden floor rather than on the ground. The first machine I made operated only in a complete circle. Then I conceived the idea of building one that would reverse, thus providing the animal with the added exercise of turning frequently. This exercised the back loins and kept the generative organs in perfect condition."

An Effective Bull Tamer

Prof. I. R. Jones, in charge of the college dairy herd, is very enthusistic over the device as a means of keeping the herd sires in good condition. He also says that it is invaluable in breaking young animals to lead and in taming unruly bulls.

"We have used Van Kleek's machine on all our bulls, ranging in age from 15 months to 18 years, and it has proven satisfactory with all of them," Jones says. "A couple of our older bulls that were inclined to be cranky were easily managed after an hour on the machine each day."

Each animal is put on for about an hour each day at the college farm. The speed of the machine can be regulated by the size of the pulleys. The college has been operating it at the rate of a slow walk for a bull and has set the trips so that the machine makes a three-fourths circle. The entire exerciser is portable and can be staked down in any convenient location.

Accurate cost records have not been kept, but agricultural engineering staff members say that with average power costs, the machine can be operated at about one cent an hour

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Farm Tasks

(*Continued from page* 18)

ciency of both men and machines. The use of electric motors with very definite power ratings and with meters showing exact amounts of power used—and paid for—has thrown the efficiency of farm machines into the lime-light. Already silage cutters and grain grinders have been carefully studied from this point of view. The attempt to secure full advantage of the use of electric energy often necessitates the reorganization of farm practices. Often this extensive reorganization offers an opportunity for a careful study of the problem of efficiency of operation.

A close-up of the gear and motor of the bull exerciser.

A layer of sand covers the lead cables

The finished bed covered with sash

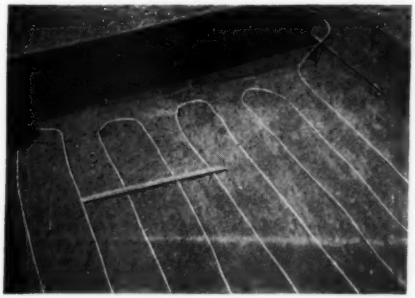
Melons
BY MODERN METHODS

By D. E. BLANDY

IN May of this year Mr. Kenneth Bullard decided to raise melons for his roadside stand. Acres of land on his farm are ideal for growing melons, and it was to give the young melon plants an early start that electricity was called upon. This is how it happened that the Rural Service Division of the New York Power and Light Corporation was asked to help.

When we arrived on the scene we found that Mr. Bullard had already made an excavation 32 feet long, 8 feet wide and 3 feet deep. In it he had set the frame for a ten sash hotbed and had insulated the bottom and the sides with 1 foot of dry clinker cinders drawn from the nearby paper mill.

We placed a 2 inch layer of sand over the cinders, first laying down burlap bags to prevent the sand from sifting into the cinders and filling the air spaces. Then under the direction of Mr. Nixon of New York Agricultural College, who has been working with electric hotbeds for the last four years, we unreeled 300 feet of No. 19 lead covered resistance wire and laid it on top of the sand in strands 7 inches apart running lengthwise of the bed. Three hundred feet of this No. 19 wire connected to a 230 volt circuit gave 1,536 watts of heating capacity, or 153.6 watts per sash. For operation in New York State, Mr. Nixon recom-



The lead covered wire evenly distributed

Left: Hotbed frame with cinders and burlap sacks in place. Lower: Thermostat bulb and automatic switch which control the temperature of the bed

mends the following wattages for hotbeds using standard sash:

	Watts Per Sash Estimated Kw. hr.	Consumption per Month
Mar. and Apr.....	75	54
Nov. and Feb.... ..	125	90
Jan. and Dec.....	200	144

We covered the cable with 1 to 2 inches of sand and then put in the soil in which the seeds were to grow. On this soil we laid the bulb of the thermostat which would turn on the current whenever the temperature of the bed went too low and would cut off the current before the soil could get too hot.

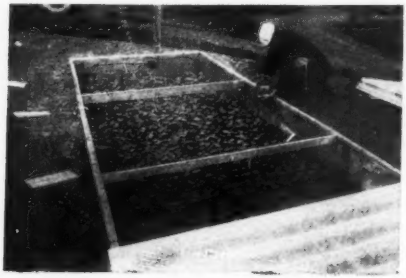
After the melon seeds were planted in this rich top soil, the whole bed was covered with ten single glazed sash and for nine days the temperature was maintained at 85 degrees Fahrenheit to hasten the sprouting of the seed and to give the young plants a good start. Then the temperature was dropped to 65 degrees for seven days to harden off the plants for setting in the field. At the end

of only sixteen days the young melon plants had reached a point where they were ready to be transplanted in the field.

Next year Mr. Bullard will start his plants even later in the year and he plans to build an additional bed similar to the one he has used this year. The details of the cost of his present hotbed together with the amount of current used this season are given below:

Current Consumption

Total: 293 Kw hrs.
Kw-hrs. per Sash, 29.3



Getting quick results cheaply. Picture taken a few days before transplanting

Three hundred feet of wire was required for the installation

Investment Cost in Electrical Equipment

300 ft. No. 19 Nichrome lead sheath wire	$20.13
1 G.E. thermostat	10.00
Electrical work, wire and labor	10.00
	$40.13

Material and Labor Furnished by Farmer

137.6 Bd. Ft. of 1½" lumber
10-5 row sashes
2 qts. of paint
1400 veneer bands
11 yds. of cinders
3 yds. of soil

Labor

Excavation—3 men—5 hrs.
Hauling cinders, 10 trips, 1 mi. haul
Man 6 hrs.
Truck 5 hrs.
Painting sash 8 hrs.
Constructing frame
2 men—3 hrs.

An Electrified Poultry Farm

By TRUMAN E. HIENTON
Agr'l. Engr. Dept., Purdue Univ.

ELECTRIC service is a valuable asset to any poultry keeper. Electricity will light the hen houses for winter egg production; it will furnish the power for grinding grain, mixing feed and pumping water. It will provide the heat to hatch the eggs and it will keep the chicks warm and contented after they are taken from the incubators and put under the brooders.

Electricity is convenient, dependable and free from fire hazard for both lighting and heating. In addition it offers an opportunity for very accurate automatic control of the temperatures under the brooder. It heats the hover without using up any of the oxygen in the air, too.

Automatic Brooders

We live on a 20 acre commercial poultry ranch. All our incubators and brooders are heated by electricity under automatic control. Every building is lighted by electricity. Our laying hens get up at 5 a. m. every day from October to March by the light of 100 watt lamps turned on by an alarm clock switch.

A special turbine deep well pump operated by a 5 H. P. motor provides us an abundant supply of water for fire protection as well as the ordinary needs of the ranch. This pump has a 3 inch discharge for irrigation, and it maintains from 20 to 40 pounds pressure in the 320 gallon pressure tank that supplies the running water to the different buildings.

Some Applications

A room in the pump house used by the hired man is heated with electricity. An electric stove in the laundry boils the cloths and an electric washing machine scrubs them clean and wrings them out for the line. An electric iron is used for the rest of the job.

Up in the kitchen we have an electric range and a water heater. We use a toaster, percolator, waffle iron and fan as part of our kitchen equipment. A vacuum cleaner and a sewing machine are also run by motors.

Last year the average monthly current consumption outside the house for the pump, laundry, for lighting the barn, chicken houses and all other out buildings; for the hatching of 7,000 eggs including custom hatching, and for the

(*Continued on page 29*)

ON THE AIR

Conducted by
JEROME J. HENRY

250 U. S. D. A. Officials Give Radio Talks

MORE than 250 officials of the United States Department of Agriculture spoke on the radio during 1931. They gave nearly 600 talks featuring news and valuable information for both town and country radio listeners.

Fifteen chiefs of Federal bureaus were included in this list of speakers who appeared in the National Farm and Home Hour.

Their messages were designed to spread the information on the developments by workers who have devoted their lives to the agricultural and scientific problems.

• • •

"America's Music" Subject for Marine Band Hour

The United States Marine Band, in its monthly concerts over a coast to coast NBC network on the first Saturday of each month at 12:30 to 1:30 p.m., Eastern Standard Time, is in the midst of its brilliant series on "Learning to Know America's Music." The February 6 broadcast features America's patriotic music, and will include such numbers as "The Star Spangled Banner," "America," "Dixie," "Yankee Doodle," "America the Beautiful," and "Over There."

Although this series, carrying interesting explanations of each number by R. A. Turner, central states 4-H club leader, is designed to teach 4-H club members more about the music of our own country, the stirring renditions by the Marine Band, often referred to as "The President's Own," are winning the favor of both town and country listeners, and many are following the compositions and explanations in group meetings held at the time of the broadcasts.

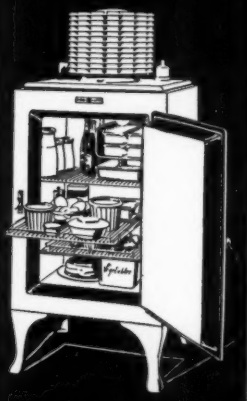
Continuing on Saturday, March 5, the hour will feature America's hymns and religious songs including, for example, "Lead, Kindly Light," and "The Little Brown Church in the Vale."

"Virginia Reel," "Arkansas Traveler," and "Old Dan Tucker" will be among the illustrations of America's country dances to be

Nan Dorland, left, and Jane Froman, famous radio personalities, are keeping their New Year resolution to be in bed at nine every evening

A LONG LIFE OF DEPENDABLE SERVICE

THE FARMER'S WIFE who has a General Electric Refrigerator never has to worry about taking care of its mechanism. For the General Electric requires no attention, not even oiling. All of its simple, current-saving mechanism is hermetically sealed-in-steel in the Monitor Top . . . proof against moisture, dust and tampering fingers. The *All*-Steel cabinet is built for a life-time of service. And every General Electric is completely guaranteed against any service expense for 3 full years. Many sizes and models. Ask your General Electric dealer, or write us for information. General Electric Company, Electric Refrigeration Department, Section CZ 1, Hanna Building, 1400 Euclid Ave., Cleveland, O.



3 YEAR GUARANTEE

OF ESPECIAL INTEREST TO WOMEN
. . . . join the GE circle on the air every week day (except Saturday) at noon, E.S.T.

GENERAL ELECTRIC
ALL-STEEL REFRIGERATOR

Domestic and Commercial Refrigerators—Electric Water Coolers and Milk Coolers

Left: Clifford Soubier, who was cradled in a theatrical trunk, comes to you as "Old Pappy" over an NBC network at 5:30 p.m., E. S. T., every day except Sunday

Right: Eunice Howard, former stage star, says she prefers radio because the only article she needs in her make-up box is a powder puff. She's the Hello girl in the new dramatic skit, "Hello Marie," heard daily except Sunday at 2:00 p.m., Eastern Standard Time

played by the Marine Band on Saturday, April 2. The following month, May 7, will find the band playing those songs that have won the hearts of Americans. In the program will be "Carry Me Back to Old Virginny," "My Old Kentucky Home," "The Rosary," "Silver Threads Among the Gold," and "A Perfect Day."

The June 4 broadcast will bring to the radio audience compositions by America's favorite composers. These will be Sousa's "Semper Fidelis," Cadman's "At Dawning," Herbert's "March of the Toys," Hadley's "Song of the Marching Men," and a number of others.

• • •

Injects His Personality Into Announcing

A. W. "SEN" KANEY, radio's veteran announcer, started his career way back in the early days of Westinghouse station KYW. There he originated his familiar informal type of announcing which is still preferred by many listeners.

And it all happened in a rather accidental way. Kaney was used to announcing by reading matter-of-fact announcements which were written on cards and handed to him before the broadcasts.

These caused him to strike upon the happy idea that he should inject his own personality into the announcing. He tried it once and was swamped with fan letters, so he continued with his friendly style which is still one of the things listeners never grow tired of hearing.

Since the day when he took to his informal announcing, his voice has been carried over the ether waves to the entire country almost daily.

His radio personality—what accounts for it? Well, "Sen" just is himself on the air. When he's not before the microphone he's a

friendly, cheerful, fast thinking radio executive.

• • •

Just Another Penalty for Over-sleeping

Like most people radio announcers hate to get up in the morning.

But a penalty has been devised at a number of the radio studios to correct this delinquency.

For an infraction of the "on time" rule announcers are required to appear on an early morning program. For a second offense, the announcer must appear to broadcast Sunday morning programs.

And by that time he generally learns to train his ears to an alarm clock.

• • •

One in 250 Receive "Mike" Positions

During the past year 2,500 applicants for announcer's positions were given auditions at the NBC studios. Ten were employed.

The rigid requirements demanded of the announcers make it extremely difficult for aspirants to land without previous local announcing experience.

When an announcer applies for a position at the network studios, he is given a difficult audition including pronunciations of involved phrases and difficult names of musical composers.

Most of the applicants are encouraged and advised to secure added experience through individual station announcing where they may develop their abilities.

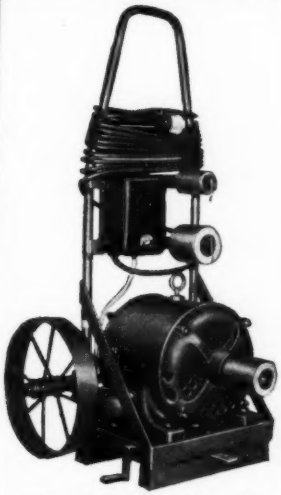
• • •

Evans Goes From Stage to Radio

Doug Evans, one of the staff of Columbia Broadcasting System announcers, was drafted by the network from station WMCA. Many of the network announcers, like Evans, receive their early training at a local station.

Evans has always been interest-

"They Keep a-Running"



5 Horse Power Century Portable Power Unit

Portability Is Only One Advantage

of this Century Portable Power Unit. Because you can move it easily from one place to another and set it up quickly to give all the advantages of a permanent installation, you can use it on any type of farm machinery requiring motor drive. Write for complete information.

Furnished for either single or 3 phase power...3, 5 and 7½ horse power motors are the popular sizes.

CENTURY ELECTRIC CO.
1806 Pine St. St. Louis, Mo.

40 U.S. and Canadian stock points and more than 75 outside thereof

Century MOTORS

ed in the stage although his parents intended that he should follow a military career. He has played leading roles in "Peggy Ann" and "A Connecticut Yankee."

• • •

Farm Boys and Army Band in Washington Hour

An appropriate George Washington program will be presented by the Future Farmers of America, organization of the boys who are studying vocational agriculture in the high schools, over a nation-wide NBC network Monday, February 8, at 12:30 to 1:30 p.m., Eastern Standard Time.

The United States Army Band, under the leadership of W. J. Stannard, will play typical Washington selections. The band is to broadcast from the Army War College at Washington, D. C.

John M. Gibbs, director of state and city organization for the Washington Bicentennial Commission, will give a brief address in the broadcast on "Washington the Farmer."

A dramatic skit by representatives of the Virginia Future Farmers is scheduled as one of the highlights of the feature. This will be followed by a review of the important news of the organization by W. A. Ross, executive secretary.

Future Farmers of America programs are broadcast at the same time on the second Monday of each month.

Chief Wolf Paw explaining to five of his "tribesmen" how the pipe of peace is used by his tribe. The Chief is on the air over a Columbia Broadcasting System network every Monday, Wednesday, and Friday at 6:30 p.m., Eastern Standard Time

• • •

Studio Chatter

Billy Page, 13 year old boy star who made his debut as a sports announcer when he was assigned to cover San Francisco's annual high school football classic received wide acclaim from those who heard his description. One letter came from a fan at Palisades, New Jersey, who listened to the entire game to hear the young announcer.

The month of February will offer many special features for radio entertainment. Many will be patriotic programs celebrating the birthdays of Abraham Lincoln and George Washington. Development of radio dramatics is helping to build interest in these features since historical events may often be thus recalled.

The mothers of Van and Don, the Two Professors who are heard every week day over a Pacific Coast network, have conclusive proof that their sons showed strong pedantic tendencies when but mere lads in grammar school. They proudly exhibit several old school books filled from cover to cover with penciled caricatures of the teachers and wise cracks about their lectures. Professor Van wrote in his seventh grade arithmetic, "My motto—never let your studies interfere with your education."

Many celebrities are nervous before the microphone, but not Frank Buck, the man who brings 'em back from the jungle alive. Buck, who was recently interviewed by Grantland Rice on a network program, admits he was jumpy during the rehearsal, but perfectly at ease when he faced the "mike."

Electrified Farm

(*Continued from page 22*)

brooding of 3,600 chicks averaged 391 kw. hrs. a month. For household uses it averaged 233 kw. hrs. a month.

From Oil to Electricity

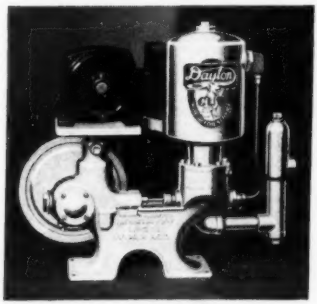
Before installing our electric range we used a blue flame, pressure type, coal oil burner in the kitchen, and this burner consumed 50 or more gallons of oil at 15c a gallon, regularly, month after month. Coal might have been cheaper, but my wife objected to soft coal, the only kind available because it was so dirty. We get the current for all our household uses for about a dollar more than we paid for oil for the kitchen stove before.

Splitting Connected Load

Since our monthly demand charge for farm power increases with the connected load, we have installed a double throw switch on the switchboard to reduce to a minimum the load connected at any one time. This was done by connecting the 5 H. P. pump motor to one side of the switch and the brooders, incubators, etc. to the other side. In winter and early spring when the incubators and brooders are operating, no lawn sprinkling and irrigation are necessary. With water used only in the dwelling house and for the stock, the 320 gallon pressure tank needs refilling only two or three times a day. This is done by throwing the double throw switch over to the pump side. The big pump fills the tank in approximately one minute and then the switch is thrown back to the incubator and brooders side again. Thus the incubators and brooders are not deprived of current for more than one minute at a time two or three times daily. By the time the lawns require sprinkling and other irrigation is needed, hatching and brooding are finished and the growing chicks are roosting.

The double throw switch can then be changed to the pump side for the summer.

NOW Only $62.50 and COMPLETELY AUTOMATIC—



You can be ready this Spring to enjoy the conveniences of running water in kitchen, bathroom, in the barn, garage and dairy buildings. No need to delay now, with the DAYTON CUB such a splendid value. It's an electrically operated, completely automatic Water Supply System with 250 gal. per hour pumping capacity and costs only $62.50 f.o.b. Dayton, Ohio.

There are other DAYTON Systems delivering up to 1473 gal. per hour with pressure tanks of varying capacities—to meet every domestic pumping need. And all equally remarkable values. Send the coupon for a full description of the CUB and other DAYTON Systems. The Dayton Pump & Mfg. Co., Dayton, Ohio, U. S. A.

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Gentlemen: Please send me your illustrated folder of the complete line of DAYTON Water Systems.

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MAKE THE *WATER* DO THE RUNNING

An afghan and pillow in which the Mount Vernon pattern has been employed

MAKING AN AFGHAN

By MRS. DANA CARRELL VAUGHAN

AS a girl I had a vacation of two glorious weeks that even yet has been unsurpassed in my memory. I can still close my eyes and see many pictures, all such happy ones, of my first trip and visit to my Grandmother's home on a farm down in Kansas.

Grandmother certainly entertained me and also taught me many worth while things and gave me many sound epigrams in her loving chatty and helpful talks. She loved to crochet and, after finding a hook and some yarn for me, taught me how to make afghans. She had made many and they were beautiful as well as useful. At the time I thought it was lots of fun, but it was not until years afterward, when I had my own home, that I fully realized what a big favor my Grandmother had done for me in teaching me the intricacies and pleasures of handwork that can be done at home during leisure time.

For pick-up fancy work in the past year I have made several afghans, a woolly one with a background of rich brown and varied centers of peach, tangerine, and tan for my living room couch; one in shades of henna and autumn colors for my sister; and a beauty in apple green, violet, orchid and geranium pink for one of the bedrooms. Each one has been so soft and comfy and so useful for a cover while reading on chilly fall evenings or for lazy times when the work was all done and the radio concerts just too good to miss hearing. The usefulness and beauty of an afghan easily offsets the effort required in making one and the small amount of money spent for yarn.

There are many interesting patterns. The Aster, Mount Vernon, Valley Forge Zig-Zag, Honeycomb, Plymouth, Crazy Quilt and

Rainbow patterns are all as different and as unusual as their names signify. Then there are modern adaptations such as the Backgammon pattern.

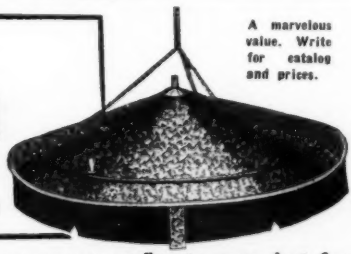
Yarns are obtainable in every shade of the rainbow and some of the new colors are unmatched in beauty.

If you are interested in owning and making one in the Mount Vernon pattern (as illustrated) you will need about four, two-ounce balls of each of the three central colors and about twelve, two-ounce balls of the background color. By varying the arrangements of the colors for the centers you can make six different squares and still have the harmony of three well chosen colors. Use the three colors in different order to get your six color combinations. Make an equal number of the different squares and then sew them together in harmonious groupings with the background shade. Your afghan can be made either square or rectangular in shape and you can sew the squares together to form either a straight edge or a scalloped one. After the squares are all made and sewn together you can crochet a few rows around the outer edge and have a finished afghan. Press your work under a damp cloth and your afghan is finished.

To make a square: Row 1, with 1st color chain 3 join in a ring, chain 2, 2 double crochet in ring chain 1, *3 double crochet in ring. chain 1, repeat from * twice, fasten in 2nd chain at beginning of row. Row two, with 2nd color fasten yarn in one of the four corners. Chain 2, 2 double crochet in same space, chain 1, 3 double crochet in same space, chain 1, * 3 double crochet in next space, chain 1, 3 double crochet in same space, chain 1, repeat from * around row, fasten. Row three, with 3rd color fasten yarn in one of the corners, chain 2, 2 double crochet in same space, chain 1, 3 double crochet in same space, chain 1, * 3 double crochet in next space, chain 1, 3 double crochet

(*Continued on page 37*)

No fire hazard with ACORN Electric Brooders



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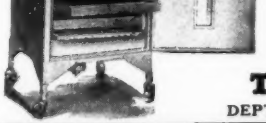
Now a sound night's sleep. Now you can say goodbye to worry about fire, gassing the chicks and overheating. Acorn Electric Brooders, with fully enclosed heating element, adjustable automatic heat control, and insulated canopy assure desired temperature without fire hazard, and are as economical to operate as a coal or kerosene burning brooder. They come complete with pilot light, thermometer, flannel curtains, shock-proof rubber drop cord, etc. (Chain and hoist extra). Write for catalog.



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DEPT. 77 TIPTON, IND.

ELECTRICAL HOUSEKEEPING

Conducted by
GAIL MEREDITH

Cooking in a Casserole

THIS is a new electric casserole. It looks like a bean jar, doesn't it? They call it a bean jar up in New England, I understand. But out in the middle west where it is manufactured it does not specialize. It just reaches out and claims to do most everything, and then goes ahead and makes good its claim.

I got my casserole a short month ago, but I already feel as though I couldn't keep house without it; I use it so constantly.

It is a round, straight-sided dish that holds just two quarts. The inside and the cover are porcelain enamel. The rest of the dish is a light metal painted cream.

The wiring is around the sides of the dish rather than on the bottom where you might expect it. There is a thick layer of insulation between the wires and the outer wall, so it does not waste its heat on the air.

There are two heats. When the current is turned on High, it uses 325 watts; on Low 100 watts. I can plug it into any convenient outlet as I would my toaster, or my percolator, but it does not need as much electricity as either of these—for it cooks slowly.

It will cook anything I would cook in a casserole in my oven, and if my experience is a fair test, it will cook it just as well.

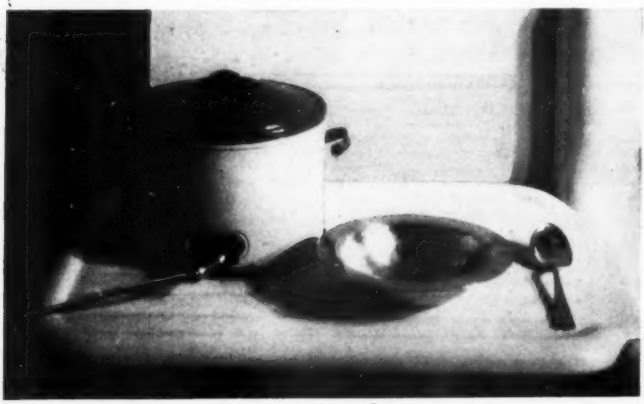
This means countless meat dishes, puddings, scalloped vegetables, rice and spaghetti combinations.

In addition to that it is excellent for cooking vegetables in small amounts of water, and it makes a snug oven for warming up a dozen rolls.

This is the very first thing I did with mine when I got it home. I was not any too sure of just what it was going to do, so I said to the family rather apologetically:

"This may be terribly slow. That wattage is not very high, but we'll try it anyway."

Then I put the rolls in and got



You can use it anywhere within cord's length of a convenience outlet

lunch on the table. When I was ready for them, I lifted the cover gingerly and found the rolls piping hot, a delicate brown around the edges and deliciously soft inside.

As soon as lunch was over, I put in some beans, properly soaked, and baked them all afternoon with their slices of salt pork and a small onion. The steam began coming out under the cover in a very short time, and I turned the current to Low, so we baked the beans with the same amount of current we use in the reading lamp by the radio.

The next thing I tried was a beef pot roast that could just squeeze into the pan. It cooked slowly a long, long time, and it was meltingly delicious. We ate it for dinner twice as pot roast; then I cooked up each delectable fragment and all the remaining gravy with flat egg noodles for the mainstay of our Saturday lunch.

After the pot roast, I used it for baked apples. And while we were getting ready for Christmas, I used it for salting nuts in butter.

It does its job well. Different households will find it serving different needs, of course. It is going to cut down the cost of cooking at our house. I have been in the habit of using the oven a great deal when it was not convenient to plan to have it full. We heated rolls for breakfast in the oven. We often had a scalloped dish, or a small roast cooking away by itself. The casserole will take care of any of those occasional jobs as well as the oven.

But I would not like it so well if all it did was cut down my use of electricity. Economical management of my cooking fuel is important to be sure, but it is not half so important as the fact that these casserole cooked foods taste good.

• • •

When Your Oven is a Broiler

IT makes small difference how many times we eat outdoors, nine times out of ten when we start to get ready for an outdoor

Care Free Cooking

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Wonderful results with such foods as fricassee chicken, Irish stew, spaghetti, baked beans, soup, etc.

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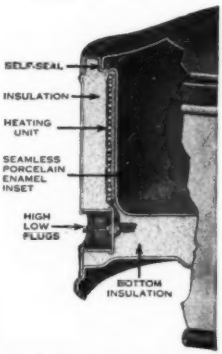

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meal the folks will say:

"Let's have a steak."

And the tenth time—the time we fuss with sandwiches and salads and baked what-nots, there's sure to be some one in the party who will scrape up the last bit of salad and say dreamily:

"It tastes good, Gail, awfully good, but do you know, I think there's nothing quite like a steak cooked on an open fire, a good hot steak in a bun."

One reason why steaks taste so good outdoors, quite apart from the fact that everything tastes good on a picnic, is that they are broiled.

We build up quite a fire and let it die down till there is a fine bed of glowing coals. Then we put our steaks on some long-handled forks and hold them down close to the fire.

The direct heat sears the meat quickly. We turn it, when it is brown, and sear the other side. Then each turns his back and forth long enough to cook it to his own taste.

Since we had to pierce the steak with the tines of our forks, we do lose some of the juices, and we let the fat dribble off onto the coals and smoke and sputter at our feet. But nobody minds a little smoke outdoors, and nobody thinks of it again anyway once he sets his teeth in that steak.

Until I got my electric range, I never tried to broil a steak indoors. Now broiling—cooking by the direct radiation of heat—has become one of the most popular ways of cooking meat at our house.

The heating unit in the top of the oven furnishes my broiling fire and a pan with a rack on it, a pan wide enough to fit into the guides for the racks in the oven, holds the meat right under the wires where it is very, very hot.

Good cooks may differ slightly on just exactly the way to broil a steak, but in general the method is the same. The particular melting excellence some women impart to the steaks they serve is an extra trick they acquire by practice.

Miss Ruth Chambers, in charge of the home economics work of one of the large stove companies, gives these directions for broiling in the electric ranges she works with:

1. Remove the broiler pan, turn the top unit on high.
2. Rub the broiler rack with a small piece of fat cut from the meat.
3. Place enough water in the broiler pan to cover the bottom. This will prevent smok-

(*Continued on page* 39)

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2-32

Questions and Answers

Conducted by H. J. GALLAGHER
Agricultural Engineering Dept.
Michigan State College

Question: *It is my idea to use the starter of an automobile to run an auto generator to charge a car battery. The electric current is 110 volt A. C., and I will need a transformer to change the current to D. C. The starter will run the generator with a belt if I can run the starter from A. C. current. How many volts would the starter of a large car stand without harm to the starter?*

J. B. Graffir,
Lost Springs, Kansas

Answer: There are three simple and practical methods of charging car batteries at home. One method is to secure a car generator, mount it on a board and belt it direct to a 1-4 h.p. alternating current motor. The leads from the generator are then connected directly to the posts of the battery to be charged. This is a portable type charger that can be used on different batteries. On cars when the generator is operated by the fan belt, the A. C. motor can be belted direct to the generator by removing the fan belt. The electric motor can be used for other purposes when not operating the generator.

A third method is to secure a radio battery charger that connects direct to your 110 volt A. C. service. These small chargers change the current from A. C. to D. C.

Do not try to use the starter of your car in combination with your generator for battery charging. There is no relation between the starter and the generator. The starter of a car is merely a low voltage D. C. motor that is energized by current from the battery when the starting switch is closed.

The 1931 November issue of ELECTRICITY ON THE FARM page 8, illustrates and more fully describes the first two methods discussed.

Question: Would like to know:

1. *Which makes the best chop, grain ground with a burr mill, or with a hammer mill?*
2. *Which is best for roughage such as cornfodder and hay, cut with knives or a hammer mill?*
3. *Grinding the same degree of fineness or cutting about the same with the same h.p., which would have the greater capacity, the hammer mill, burr mill or knife mill.*

Answer: Between the burr mill and the hammer mill there is practically no difference in the quality of grinding as far as feeding value is concerned.

The hammer mill would process roughage much finer than would a knife cutting machine such as the ensilage cutter or knife type roughage cutter. There is considerable argument as to the value of cutting roughage. A number of experiment stations report that the cutting of roughage for cattle is an unnecessary expense. The knife type roughage cutter has greater capacity per h.p. than has the hammer mill.

The power requirements of a burr mill vary with the sharpness of the burrs. A burr mill with good sharp burrs uses less power to grind the same fineness than will the hammer mill. With dull burrs, the same mill would require three to five times as much power as would the hammer mill.

Other advantages of the hammer mill are that it can run idle without injury and the usual bits of stone and metal found in grain have no effect on it, neither does straw or chaff affect its efficiency.

I cannot answer your question on the knife mill as I have never seen or heard of a knife mill.

Making an Afghan

(*Continued from page* 31)

in next space, chain 1, 3 double crochet in same space, chain 1, repeat from * around row, fasten. Row 4, with fourth color or background fasten yarn in one of the corners, chain 2, 2 double crochet in same space, chain 1, 3 double crochet in same space, chain 1, * 3 double crochet in next space, chain 1, 3 double crochet in next space, chain 1, 3 double crochet in next space, chain 1, 3 double crochet same space, chain 1, repeat from * around row, fasten. Row five with same color as row 4, fasten at corner and work in the same manner. This completes one square. After squares are sewn together you can work the border as follows: Row one, with background color, work 1 row of single crochet. Row 2, chain 2, *double crochet in third stitch, double crochet in second stitch. Repeat from * around row. Work three more rows. Row 5, with one of the colors single crochet. Row 6, change color, single crochet around row. Row 7, change to other color * 1 single crochet, chain 3, 1 single crochet in same stitch, skip a stitch, repeat from * around row, fasten.

Radio Used in Insect Control

By VERNON E. BUNDY
The Ohio State University, Columbus, Ohio

TIME is money on the farm as well as in the automobile assembling plant or in Wall Street, and the radio can save time. One of the most extensive and elaborate uses of the device in American agriculture took place in Ohio last year when some 3,000 fruit growers of the state depended upon their receiving sets for vital information, at the vital moment, on application of spraying material to their fruit trees. Twelve hours more or less in applying the spray sometimes can

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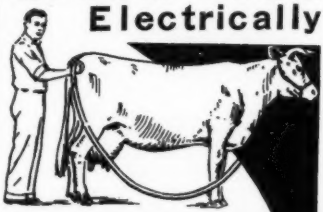

EVERY feature of the Hinman Groomer has been developed from the standpoint of the modern dairyman. Light in weight, portable and durable, its powerful suction gives speedy, thorough, sanitary grooming. Operates from any 110 volt light socket; runs 1,000 hours without lubricating. *Send today for illustrated folder and free demonstration offer.*

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HINMAN GROOMER

spell the difference between a fruit crop and no fruit crop.

The spray information service referred to was set up and managed by the agricultural specialists of the Ohio State University at Columbus, and from the Ohio Agricultural Experiment Station at Wooster, and the United States Weather Bureau, with the cooperation of two of the largest broadcasting stations in the state.

Essential Factors

Three factors enter into the successful combating of plant diseases and parasites with spray. One is the stage of development reached by the fruit trees themselves and by the spores of parasites and the germs of disease; another is the weather condition, which may entirely neutralize a spray application or make a different application imperative; the third is the formula of the spray material to be applied.

In the very early spring, entomologists, pathologists and horticulturists were stationed in various sections to make a daily check on the development of the trees, the parasites and the disease germs. Reports on this development were relayed by telephone and telegraph to the supervisor at his headquarters at the university.

A special, detailed weather report and forecast was also furnished daily by the United States Weather Bureau. The formula of the spraying material to be used under given conditions were already known. By 11 o'clock every morning during the spraying season the authorities in charge knew exactly what should be done in each of the seventeen districts of the state.

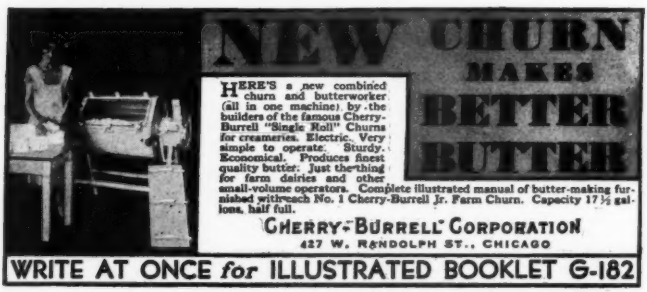
During the five years in which the service had been developing, every practicable method of communication has been used in getting this information to the growers of fruit. The mail service was too slow; individual telegraph or telephone messages were too costly; telephone relays, through which one man in each neighborhood is notified and undertakes to notify the other growers, have been moderately successful. But the most efficient method has been radio broadcasting.

Radio Widely Used

In a canvass of the fruit growers of the state, of whom between 3,000 and 4,000 are using the spray information, it was learned that more than 80 per cent of the orchardists had radio receiving sets and prefer to get their information through them.

Therefore it was arranged to relay information about spraying materials and formulas, through the offices of the county agricultural agents, instructing the growers to wait until they have the signal by radio, before they apply a given spray.

Spray information was broadcast on Mondays, Wednesdays and Fridays, from station WLW at Cincinnati, at 11:50 a. m. When the trees in the northern part of the state advanced to the spraying stage, the broadcasts were also given from station WTAM in Cleveland, at 12:30 p. m. on the same days.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WRITE AT ONCE for ILLUSTRATED BOOKLET G-182

When Oven is a Broiler

(*Continued from page* 34)

ing. Do not use too much or meat will be steamed.

4. Wipe meat with a damp cloth and place on broiler.
5. Place broiler in oven on top slide and sear one side.
6. Turn and sear reverse side. Avoid piercing the meat with a fork as this will cause loss of juice.
7. After searing, do not turn meat until it is done on one side. If the meat is continually turned, the side away from the fire cools, and it takes longer to cook. This dries the meat and injures the flavor. The meat is ready to turn when the side away from the heat has a fluffy appearance and jets of steam escape from it.

Of course, you can handle the meat by laying the tines of the forks flat on the surface, but it seems to me that one of the best ways to avoid piercing the meat with a fork is not to use one, but to take two spatulas instead and turn the meat with them.

The oven door is left partly open throughout the broiling so you can keep a weather eye on the meat while the rest of the dinner is going forward. You need to watch it closely, for broiling, you know, is a quick process.

One of the tricks of better broiling is to brush your meat with melted butter before it goes into the oven—and to add another dab for good luck when you salt and pepper it after it comes out.

There will be some difference of opinion about Miss Chambers' point in No. 7. She herself admits that if the meat is very thick, it may have to be turned more than once, but if, after the searing is done on both sides, you drop the broiler down two or three notches, and let the heat penetrate the meat more slowly, you still may find that only one turning after both sides are seared will cook the meat perfectly.

Most cookbooks warn you that only the tenderest cuts are suitable for broiling. We are learning that that is not necessarily true. We began with good thick steaks and chops—thick so we could have a crusty brown surface and tender juicy meat inside—but we are finding that other things can be broiled as well. Ground meat of cheaper cuts can be broiled appetizingly. Tomatoes and mushrooms, bananas, and slices of apple and raw pineapple can be broiled. Most cooked vegetables, except the leafy green ones, and many cooked fruits can be added to the broiler a few minutes before the meat is done. A friend of mine who is famous locally for her grilled dinners dips slices of cold potato, both white and sweet, into melted butter, rolls them lightly in a plate of seasoned flour, and arranges them on the edge of the broiler to cook to a golden brown. Quite often she adds a row of canned peaches or apricots just before the rest is done and has a colorful garnish for her platter.

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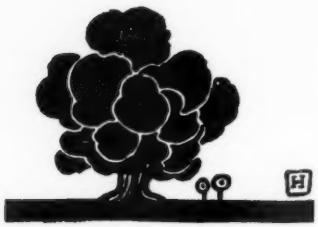

Under The CHESTNUT TREE

No Tricks

It it plain to see that Gandhi, Indian's patriarch, hasn' anything up his sleeve.

Not Prowess

"My brother has a gold medal for running five miles, a silver medal for swimming, two cups for wrestling, and badges for boxing and rowing."

"He must be some athlete."

"No, he's a pawnbroker."

How the News Got Around

Visitor (to host's little girl) "How do you know this is the first of the month?"

Little Girl: "Cause all of Daddy's letters got front windows in them."

Necessity?

"Rastus, I am sorry to hear that you have buried your wife?"

"Yas Suh, boss, I just had to—she was daid."

It was an arduous task for the teacher to drum into her youthful pupils the principles of arithmetic.

"Now listen," she said, "In order to subtract, things have to be in the same denomination. This is what I mean: Now, you couldn't take three apples from four peaches, not eight marbles from eight buttons. It must be three apples from four apples, and so on. Do you understand?"

The majority seemed to grasp the idea. One perky little youngster in the rear, however, raised a timid hand.

"Please, ma'am." he inquired, "couldn't you take three quarts of milk from two cows?"

Making Use of Mr. Tubbs

"George Washington Tubbs, said the judge sternly, "you're plain no-account and shiftless and I'm going to send you away for a year at hard labor."

"Please, Jedge," interrupted Mrs. Tubbs from the rear of the courtroom, "will yo' Honah jes' kinder split dat sentence? Don't send him away from home, but let dat hard labor stand."

Point of View

"How did Moneybag make all his money?"

"By judicious speculation and investment."

"How did Poorman lose all his money?"

"Gambling on the stock market."

"Ah," said the doctor, looking into one eye, "it is easy for me to see what is the matter with you! This is not merely eye trouble; it is an affection of the nervous system. There are all the signs of liver trouble, of fatty degeneration of the heart, of a bad blood supply. The only thing I can recommend is—"

"Here, here!" cried the patient. "Isn't it about time you looked into the other eye? That's my glass one, you know."

The Dog Peered In

The motorist drove his baby car back to the works.

"I want all the wheels taken off," he said, "and replaced by four big ones. I'm not going to have every Sealyham that passes barking through *my* windows."

What's in a Name?

Taken from a collection of marriage announcements copied from old newspapers published in the last century:

At Black Lake, L. I., February, 1828, James Anderson, to Miss Ann Bread.

While toasts the lovely graces spread,
And fops around them flutter,
I'll be contented with Ann Bread
And won't have any but her.

In Bozrah, Conn., August, 1819, Mr. John Bate of Williamstown, Mass., to Miss Mary Ann Bass, after a courtship of one hour.

Is this not angling well, I ask,
Such tender bait to take?
He caught in one short hour a Bass;
The Bass, though, caught the Bate.

In Washington, May 17, 1834, Joshua Peck to Miss Amelia Bushel.

Alzookers, bobs and wedding cakes—
What changes of measures marriage makes;
Quick as a thought, at Hymen's beck,
A Bushel's changed into a Peck.—
Christian Science Monitor.

Electricity Reduces Fire Hazard on Poultry Farm

By J. C. Scott

AS a safety factor against fire, electric apparatus is considered extremely important by poultrymen of the Northwest, as evidenced in the following statement by C. W. Hewson, who operates a commercial poultry farm near Anacortes, Washington, where 1,800 baby chicks and buildings were completely destroyed by fire a year or so ago

"I had just been in the brooder house," said Mr. Hewson, "looking over the chicks, and had no more than stepped out of the door when I heard an explosion, apparently caused by gas generating in the coal heaters. When I looked around, the whole interior of the brooder house seemed to be in flames, and there was nothing I could do except run for the pump and water pails.

"Mrs. Hewson called the Fire Department and several neighbors, but before they could arrive it was too late to save anything. We lost 1,800 baby chicks. There were a few that got out, but they chilled badly. The chicks were about two weeks old."

"You may be sure the next brooders will be electric," continued Mr. Hewson. "I have read a lot about them, but like everyone else thought the old method safe enough and a fire would not hit me. But when a fellow has had the actual experience of a fire loss, he will give the safety factor more thought in his next venture."

ESCO

Reg. U. S. Pat. Off.

Electric Milk House Equipment

Milk Coolers for cans . . . and for bottled milk . . . Dairy Water Heaters . . . Dairy Utensil Sterilizers.

Write for full details

ESCO CABINET CO.
WEST CHESTER, PENNA.

New AUTOMATIC ELECTRIC BROODER HEATER — ECONOMICAL DEPENDABLE FUMELESS

$3.95 Post Paid

FREE INSTRUCTIONS for easily making home-made hover for this automatic heater. Healthful, circulated heat. No hot spots; no fumes; no dust or dirt; no bother or worry. Steady, even black heat prevents crowding of chicks. Allows use of entire floor. Sturdy galvanized metal construction. Easily cares for over 200 chicks. 110-volt Heater Complete $3.95 Postpaid. Send Money Order or C.O.D. FREE Folder—other electrical appliances.

Rural Electric Supply House
Coldwater, Ohio

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is for your
convenience.
Why not use it?

PAINT with
ELECTRICITY
It is easier and cheaper with
Paint-o-Mister
Paint or varnish anything—spray disinfectants. Make money painting for neighbors. Agents and dealers wanted.
ATCO PRODUCTS CORP.
7 West Scott Ave., Rahway, N. J.
Write for circular

● PAUL ●
WATER SYSTEMS
Provide Running
Water at Low Cost
WRITE US
THE FT. WAYNE ENGINEERING & MANUFACTURING CO.
1722 N. Harrison St.,
FORT WAYNE, IND.

Tiresome Task Banished

I consider my washer a wonderful electrical servant, as there never was a task so tiresome and back-breaking for a woman as bending over a washboard or turning a hand washer.

I can do my washing in less than half the time at a very small cost and am physically able to do other work the same day that could hardly be accomplished the old way of washing.

Also, the clothes wear much longer than when washed by the long and hard-rubbing method, which means a saving of money.

MRS. NOAH GANGWER,
R. 8, Frankfort, Ind.

• • •

The Greatest Convenience

Our electric water system is the most useful electric servant in our home, because it's the greatest convenience we have. It provides the pleasures and conveniences of a city home on our farm with one-half the city rate. We do not have to endure the drudgery of pumping and carrying water when electricity is at hand. Running water is available when desired; all we have to do is turn the faucet and electricity takes care of the rest. Dad says, "Electricity adds life to your years as well as years to your life."

MISS C. VAN DER GIESSEN,
Box 67, R. 1, Lansing, Ill.

• • •

Hard to Beat

Talking about servants, I have one that is hard to beat outside of its class. My 5 horsepower motor is a great help and comfort. No cranking, or carrying of water in cold weather when unloading corn. I just throw in the switch and the motor-driven elevator does the rest.

Also when sawing wood or grinding feed with my eight-inch grinder with an elevator on it.

The motor is a great time-saver when unloading hay with a hoist. When pumping water it is a servant hard to beat.

ARTHUR SPAHN,
R. 1, Denison, Iowa.

Takes the Lead

To all my other "electrical servants" I apologize when I place my electric refrigerator in the lead of electric servants.

The refrigerator has given our family of four children perfectly kept foods at all times. Not a doctor bill or any stomach disorders when foods, including milk, are kept this perfect way.

Our baby helps herself to oranges from the bottom shelf, also looks to the trays and says, "I want ice cream, mamma." I am sure perfect refrigeration has helped build her from a hospital patient to state grand champion and made things more pleasant for me and all the rest of our family.

MRS. L. R. RIKLI,
Murdock, Neb.

CLASSIFIED ADVERTISING

The LYON ELECTRIC COMPANY manufacture electric poultry equipment exclusively. Long, practical experience in the highly developed California rural electric field enables us to furnish quality devices at reasonable prices. The LYON line includes: Brooders—Incubators — Egg Testers — Burglar, Temperature and Power-off Alarms — Heating Elements—Thermostatic Supplies—Time Switches—Wiring Supplies. Write for catalog today. LYON ELECTRIC COMPANY, 2075 Moore Street, San Diego, California.

FARM SHOP BULLETIN 31 outlines the possibilities in SERVICING FARM MACHINERY in your own workshop at minimum cost. Plans for doing various jobs also supplied. BULLETIN MAILED FREE on request. SOUTH BEND LATHE WORKS, 570 Madison Street, South Bend, Indiana.

The PARAGON POULTRY TIME SWITCH is scientifically designed and approved by leading authorities It provides automatic control both morning and night and DIMS THE LIGHT AT NIGHT to allow the hens to return to roost. Low in price and unconditionally guaranteed. Write for full information today. PARAGON ELECTRIC COMPANY, Van Buren & Dearborn Sts., Chicago, Ill.

COVER TITLE CONTEST

December Winners

First Prize - $25.00

"Inside — outside
Yuletide — electrified"
F. D. Glover,
R. 1, Rosedale, Ind.

The following titles have been selected as winners of the $5.00 cash prizes:

"The electrical farm elects to say . . . 'Merry, Merry Christmas' the electrical way."
Mrs. E. B. Barker,
Crown Point, N. Y.

"Outside and in — electric cheer . . . On Christmas eve and thru the year."
Mrs. Geo. H. Clever,
R. 2, Box 69, Tracy, Cal.

"Electric candles bring Christmas cheer . . . Without the danger of fires to fear."
Roger A. Clark,
R. 3, Marengo, Ill.

"Electric lights bring comfort and cheer . . . At Christmas time and throughout the year."
Mrs. Hollis Moulton,
R. 1, East Hartford, Conn.

"Electrically lighted, spreading good cheer . . . Inviting Old Santa to be sure to stop here."
C. C. Bodeker,
Emporia, Va.

RULES for February Contest

For the best title to this month's front cover illustration, a cash prize of $25.00 will be awarded.

In addition, we will pay $5.00 for each of five titles given honorable mention.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

The winners will be announced in the April issue.

Only the farmers or members of the farm family, to whom this magazine was sent, are eligible.

Only one title may be submitted.

Use the form below or write your answers on a plain sheet of paper in similar form.

Contestants must answer question (A).

Write plainly and send your suggestion to the Title Editor, ELECTRICITY ON THE FARM, 24 W. 40th St., New York, before March 1, 1932.

My title for the February Front Cover picture of ELECTRICITY ON THE FARM is

.....

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.....

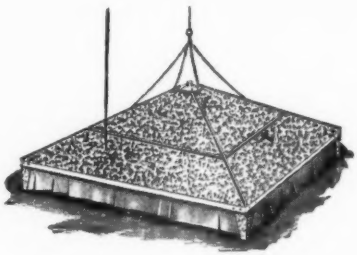
.....

(A) Mark X after any of the Electric Farm Shop Equipment you own:

Electric Drill ☐ Electric Paint Sprayer ☐
Electric Soldering Iron ☐ Electric Tool Grinder ☐
Electric Woodworker ☐

My name is..... R. F. D.....

Post Office..... County..... State.....



Hatching and Brooding Chicks

ELECTRICALLY

Pays Bigger Profits

You can cut your costs of hatching and brooding chicks this year by using electric equipment.

Electric brooders and incubators are automatic. Temperatures remain constant day and night. There are no lamps to care for; no worries about overheating.

Considering the low cost of operation, the saving in time and labor, and the freedom from fire hazards, you can't afford to use obsolete methods of incubating and brooding. Use your electric service for bigger hatches, healthier chicks, and larger profits.

NORTHERN INDIANA PUBLIC SERVICE COMPANY

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